

Illness Following MMR Immunization In Indian and Non-Indian Children

SUMMARY

A cohort study was undertaken to see if the frequency of office reported illness during the three weeks after MMR immunization was greater among Indian children (N=127) compared to non-Indian children (N=81) attending a family practice centre. All children had been given HPV₇₇DE₅ vaccine or RA 27/3 vaccine between ages 11 and 24 months. Illness after immunization was not related to frequency of attendance at the medical centre or weight at age 12 months. The overall illness rate for Indian children was almost twice the rate for non-Indians. Indian children who were ill before immunization were more likely to be ill during the three week post-MMR period. No such relationship was noted among non-Indian children. This suggests that children with an established record of frequent illness are likely to experience an illness following MMR immunization. These results need to be confirmed by a prospective study. (Can Fam Physician 1983; 29:1445-1450).

SOMMAIRE

Une étude cohorte a été entreprise afin de déterminer si la fréquence de maladie au cours des trois semaines suivant l'immunisation MMR était plus grande chez les enfants indiens (N=127) comparativement aux enfants non-indiens (N=81) suivis dans une clinique familiale. Tous les enfants ont reçu le vaccin HPV₇₇DE₅ ou le vaccin RA 27/3 entre les âges de 11 et 24 mois. La maladie après immunisation n'était pas reliée à la fréquence des visites à la clinique médicale ou au poids à l'âge de 12 mois. Le taux de maladie post-MMR chez les enfants indiens s'est avéré presque le double de celui des enfants non-indiens. Les enfants indiens qui étaient malades avant l'immunisation avaient plus de chances d'être malades au cours de la période de trois semaines post-MMR. Aucune relation semblable n'a été notée chez les enfants non-indiens. Ces résultats suggèrent que les enfants ayant une histoire de maladie fréquente ont plus de chances d'être malades après le vaccin MMR. Ces résultats devront être confirmés par une étude de type prospectif.

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RUBELLA IMMUNIZATION policies in Canada generally advocate that children be given the vaccine, usually a combination measles-mumps-rubella, at age 12 months or older.¹ In Ontario, most infants are immunized at 15 months.² The vaccine can produce a fever, with or without a rash in some children. Other adverse reactions are extremely rare.

The prevailing clinical impression at

Southwest Middlesex Health Centre has been that Indian children frequently present with illness, particularly respiratory infections, in the three weeks following MMR immunization. In an earlier study of morbidity among children living in southwestern Ontario, the incidence of office-reported illness during the first year of life in Indians was almost twice the rate for non-Indians.³ The quality of medical care available to both groups of children was similar, yet this difference persisted into the second year.⁴ In addition, Indian children were heavier than non-Indian children by the end of the first year; over 17% of the Indian infants were at or above the 95th percentile weight for sex compared to 4.4% of non-Indian infants.⁵

Our objective, therefore, was to determine whether or not the clinical im-

pression was correct. Was the frequency of illness following MMR immunization greater among Indian children? If so, does this higher rate of illness merely reflect the ethnic difference in morbidity previously documented, or is there sufficient evidence to suggest that adverse reactions to MMR vaccine are more common in Indian children?

Southwest Middlesex Health Centre is a family practice located in a rural area approximately 25 km from London, Ontario. It is one of four family medical centres affiliated with the Department of Family Medicine at the University of Western Ontario. There are 4500 registered active patients, of whom one-third are Indians (Oneida, Chippewa, and Muncey bands) living on nearby reserves. The remaining two-thirds of the patient population are

Tagamet® (cimetidine)

PHARMACOLOGICAL CLASSIFICATION

Histamine H₂-Receptor Antagonist

ACTION

Cimetidine competitively inhibits the action of histamine at the histamine H₂-receptor. It inhibits daytime and nocturnal basal gastric acid secretion and also gastric acid secretion stimulated by food, histamine, pentagastrin, caffeine and insulin. Total pepsin output is reduced as a result of the decrease in volume of gastric juice. Cimetidine has no effect on the rate of gastric emptying or lower esophageal sphincter pressure.

INDICATIONS

- Duodenal ulcer and prophylaxis of recurrent duodenal ulcer
- Non-malignant gastric ulcer
- Gastroesophageal reflux disease
- Management of upper gastrointestinal hemorrhage
- Pathological hypersecretion associated with Zollinger-Ellison Syndrome, systemic mastocytosis and multiple endocrine adenomas.
- Prophylaxis of stress ulceration
- Prophylaxis of acid aspiration pneumonitis

CONTRAINDICATIONS

None known.

PRECAUTIONS

Use in Pregnancy, Nursing Mothers: Experience in pregnant patients is limited. Animal studies have revealed no evidence of impaired fertility or harm to the fetus. 'Tagamet' crosses the placental barrier. It is secreted in human milk. Anticipated benefits should be weighed against potential risks. 'Tagamet' has been used in clinical trials for the prevention of acid aspiration pneumonitis in women undergoing cesarean section or vaginal delivery without harm to the fetus.

Use in Children: In limited experience, 20-40 mg/kg/day has been administered in divided doses by mouth or intravenously. Anticipated benefits should be weighed against potential risks.

Use in Impaired Renal Function: A reduced dosage should be administered to patients with impaired renal function. (See DOSAGE AND ADMINISTRATION.)

Drug Interactions: 'Tagamet' may reduce the hepatic metabolism of warfarin-type anticoagulants, phenytoin, propranolol, chlor-diazepoxide, diazepam and theophylline, thereby causing increased blood levels of these drugs. Benzodiazepines metabolized by other systems do not exhibit this effect. Since clinically significant effects have been reported with warfarin anticoagulants, close monitoring of prothrombin time is recommended, and adjustment of anticoagulant dose may be necessary.

Use in Gastric Ulcer: Symptomatic response to 'Tagamet' does not preclude the presence of a gastric malignancy.

Rapid Intravenous Injection: Rare cases of cardiac arrhythmias and hypotension have been reported following the rapid administration of 'Tagamet' Injection by intravenous bolus. (See DOSAGE AND ADMINISTRATION.)

ADVERSE REACTIONS

Mild and transient diarrhea, tiredness, dizziness and rash have occurred in a small number of patients. A few patients have developed mild, reversible gynecomastia during prolonged treatment. A few cases of the following have been reported: decreased white blood cell counts (including agranulocytosis), thrombocytopenia, aplastic anemia; reversible confusional states, usually in elderly and/or severely ill patients with renal insufficiency or organic brain syndrome; fever; hepatitis; interstitial nephritis; pancreatitis; small increases in plasma creatinine and serum transaminases.

OVERDOSAGE

Oral ingestion of up to 20 grams has caused no untoward effects. Recovery has been uneventful.

Treatment: Emesis and/or gastric lavage, monitoring and supportive therapy. Assisted respiration may be of value.

DOSAGE AND ADMINISTRATION - ADULTS (Experience in children is limited - see PRECAUTIONS.)

In clinical studies, 'Tagamet' has been used in divided doses of up to 2400 mg per day.

ACTIVE DUODENAL ULCER, NON-MALIGNANT GASTRIC ULCER, GASTROESOPHAGEAL REFLUX DISEASE

600 mg twice a day (at breakfast and bedtime) or 300 mg four times a day (with meals and at bedtime). Therapy for duodenal ulcer should continue for at least 4 weeks; for gastric ulcer 6 weeks; for reflux disease 8-12 weeks.

Prophylaxis of Recurrent Duodenal Ulcer: 400 mg at bedtime or 300 mg twice a day, at breakfast and bedtime. Therapy should continue for at least 6-12 months.

UPPER GASTROINTESTINAL HEMORRHAGE If bleeding is of sufficient magnitude as to require blood transfusions, 'Tagamet' should be administered parenterally, preferably by intravenous or intermittent infusion, until 48 hours after active bleeding has stopped. Oral administration may then be instituted.

Oral: 600 mg twice a day (at breakfast and bedtime) or 300 mg every 6 hours.

Intramuscular Injection: 300 mg every 6 hours.

Intravenous Injection: 300 mg every 6 hours. Dilute 'Tagamet' in Sodium Chloride Injection 0.9% (or other compatible i.v. solution) to a total volume of 20 mL; inject slowly over at least 2 minutes. Avoid this method in patients with cardiovascular disease.

Intermittent intravenous infusion: 300 mg every 6 hours. Dilute 'Tagamet' in 100 mL of Dextrose Injection 5% (or other compatible i.v. solution); infuse over 15-20 minutes. If necessary, increases should be made by more frequent administration of a 300 mg dose; total daily dose should not exceed 2400 mg.

PATHOLOGICAL HYPERSECRETORY CONDITIONS

(e.g., Zollinger-Ellison Syndrome) 300 mg four times a day, with meals and at bedtime. It may be necessary to administer higher or more frequent doses to control symptoms. If intravenous administration is required, refer to schedule under UPPER GASTROINTESTINAL HEMORRHAGE.

PROPHYLAXIS OF STRESS ULCERATION

300 mg intravenously every 6 hours, or more frequently to maintain a gastric pH above 4. (See Intravenous administration above.)

PROPHYLAXIS OF ACID ASPIRATION PNEUMONITIS

Emergency surgery: 300 mg intramuscularly 1 hour before induction of anesthesia and 300 mg intramuscularly or intravenously every 4 hours until patient responds to verbal commands.

Elective surgery: As above, but an oral dose of 300 mg may be given the night before the operation.

For intravenous administration refer to schedule under UPPER GASTROINTESTINAL HEMORRHAGE.

DOSAGE ADJUSTMENT FOR PATIENTS WITH IMPAIRED RENAL FUNCTION

300 mg every 12 hours orally or intravenously. If required, frequency of dosing may be increased to every 8 hours or further with caution. In severe renal failure the lowest frequency of dosing compatible with an adequate patient response should be used. Liver impairment may necessitate further reductions.

Hemodialysis: More than 80% of a 300 mg intravenous dose is cleared in one 4 hour period of hemodialysis. If possible, adjust dosage schedule to coincide with end of hemodialysis.

Peritoneal dialysis: 'Tagamet' is not removed to any appreciable extent.

STABILITY OF INJECTABLE FORM

'Tagamet' Injection, when added to or diluted with most intravenous solutions, is stable for 48 hours at room temperature.

'Tagamet' Injection should not be refrigerated.

AVAILABILITY

Tablets: 200, 300, 400 and 600 mg cimetidine. **Liquid:** Cimetidine hydrochloride equivalent to 300 mg cimetidine per 5 mL. (Alcohol content 2.85% v/v.)

Injection: Cimetidine hydrochloride equivalent to 300 mg cimetidine per 2 mL.

Product Monograph available to physicians and pharmacists on request.

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Caucasian residents of neighboring rural communities.

Subjects and Methods

Southwest Middlesex Health Centre maintains a computerized age-sex register of active patients. By definition, patients are considered active if at least one household member visited the centre in the past two years. A listing of all children whose mothers were active patients of the centre at the time of delivery was obtained for the years 1974-1981. The following information was abstracted from the medical record for each child: sex, birthdate, gestational age, birthweight, ethnic origin (Indian or non-Indian), total number of visits to the health centre during the first 12 months of life, weight at 12 months, episodes of illness three weeks before and three weeks after MMR immunization was given (including after-hour visits), and date of MMR immunization.

We defined an episode of illness as all visits for a specific illness from its onset to its resolution.⁶ If more than one visit was required for treatment, this was still regarded as a single episode.⁴ Illnesses were coded according to the International Classification of Health Problems in Primary Care.⁷ We excluded from consideration all diagnostic categories which could not possibly be related to MMR immunization i.e., injuries and trauma. The remaining categories were grouped as follows: upper respiratory infection, lower respiratory illness, otitis media, infective disease, skin disease, and fever.

During the years under study, the type of MMR vaccine used at the centre was changed. To examine the possibility that illness following MMR immunization might be related to the type of vaccine used, we also noted whether each child had received MMR (HPV77DE₃) or MMR II (RA 27/3) vaccine.

We used the National Center for Health Statistics Growth Standards⁸ as the basis for dividing children into obese and non-obese groups. Obesity was defined as weight at or exceeding the 95th percentile at age 12 months. The lower limits of obesity were 11990 grams for males, 11240 grams for females.

Standard statistical techniques were used to analyze the data, including the chi-square test for comparing two proportions in independent samples⁹ and

the McNemar test to compare proportions in paired samples.¹⁰

Results

There were 146 Indian and 84 non-Indian children eligible for inclusion in the study. Of these, 19 (13%) Indian and three (3.7%) non-Indian children had been given the MMR vaccine after 24 months of age. We confined our analysis to children immunized between 11 and 24 months (127 Indian and 81 non-Indian).

Study cohorts

Males comprised 49.2% of the Indian cohort and 49.4% of the non-Indian cohort ($\chi^2_1 = 0.0$; $p > .05$). There was no ethnic difference in gestational age, birthweight, or frequency of attendance during the first year (Table 1). The mean age for MMR immunization was 15 months for Indians and 14 months for non-Indians. At age 12 months, Indian children were heavier and the proportion at or exceeding the 95th percentile was twice that of non-Indian children.

Type of vaccine

A slightly higher proportion of Indian children (66.1%) received HPV₇₇DE₅ vaccine compared to non-Indian children (54.3%) ($\chi^2_1 = 2.44$; $p = .12$).

In Indian children 20.2% (17 of 84) receiving HPV₇₇DE₅ vaccine and 16.3% (seven of 43) receiving RA 27/3 vaccine were ill at least once in the three weeks following immunization ($\chi^2_1 = 0.09$; $p > .05$). There was also no difference in the frequency of illness between the two types of vaccines in non-Indian children: 15.9% (seven of 44) of those given HPV₇₇DE₅ vaccine and 10.8% of the children given RA 27/3 vaccine had at least one episode of illness in

the three weeks following immunization ($\chi^2_1 = 0.17$; $p > .05$).

Illness pre- and post-MMR

We examined the possibility that illness during the three weeks before the MMR vaccine was given might increase the risk of illness after immunization. In the Indian cohort, 23.8% of the children who were ill before immunization suffered an illness after the vaccine was given. Of the Indian children not ill pre-MMR, 16.5% were ill in the three weeks post-MMR (Table 2). No association between health status pre- and post-MMR was found for non-Indian children.

Although the difference between the two cohorts in the proportions receiving HPV₇₇DE₅ vaccine was not statistically significant, we looked at the relationship of health status before immunization to health status after immunization, according to the type of vaccine administered, to ensure that the relationship we observed in Indian children for illness pre- and post-MMR was not specific for the vaccine. Unfortunately, once the type of vaccine was taken into consideration, the number of children who were ill post-MMR was very small. Nonetheless, when the findings of 23.8% and 16.5% in Table 2 are separated according to the type of vaccine, the corresponding percentages are as follows: for HPV₇₇DE₅ vaccine, 27.3% and 17.7%; for RA 27/3 vaccine, 20.0% and 13.0%. Thus, although statistical techniques were not used because of small numbers, the relationship seemed consistent for both vaccines.

There was no association between weight at age 12 months and illness during the three weeks post-MMR in either cohort (Table 3). Therefore weight was not likely to influence the relationship shown in Table 2.

TABLE 1 Descriptive Characteristics of the Study Children

Characteristic	Indian (N=127) mean SE	Non-Indian (N=81) mean SE	t-value
Birthweight (g)	3378 (± 58.5)	3292 (± 74.8)	0.90
Gestational age (weeks)	39.6 (± 0.2)	39.4 (± 0.2)	0.40
Age at MMR (months)	15.4 (± 0.3)	14.3 (± 0.2)	2.60;
Weight at age 12 months (g)	10301 (± 151.4)	9814 (± 204.7)	$p = 0.02$
Frequency of attendance (visits)	12.1 (± 0.43)	11.8 (± 0.58)	1.95;
			$p = 0.06$
			0.45

Cecilor® cefaclor

ACTION: The bactericidal action of Cecilor results from the inhibition of cell-wall synthesis.

INDICATIONS AND CLINICAL USES: Cecilor may be used in the treatment of the following infections caused by *Streptococcus pyogenes* and *Streptococcus pneumoniae*, *Staphylococcus*, including coagulase-positive, coagulase-negative, and penicillinase-producing strains, *Escherichia coli*, *Proteus mirabilis*, *Klebsiella pneumoniae*, *Haemophilus influenzae*, including ampicillin-resistant strains.

1. Otitis media
2. Lower Respiratory Infections, including pneumonia, bronchitis, and pulmonary complications resulting from cystic fibrosis.
3. Upper Respiratory Infections, including pharyngitis and tonsillitis.
4. Skin and Soft-Tissue Infections
5. Urinary Tract Infections

Appropriate culture and susceptibility studies should be performed.

CONTRAINDICATIONS: Cecilor is contraindicated in persons who have shown hypersensitivity to the cephalosporin antibiotics.

WARNINGS: Before therapy with Cecilor is instituted, careful inquiry should be made concerning previous hypersensitivity reactions to cephalosporins, penicillins or other drugs. Cephalosporin C derivatives should be given only with caution to penicillin-sensitive patients. There is some evidence of cross-allergenicity between the penicillins and the cephalosporins. Patients have been reported to have had severe reactions (including anaphylaxis) to both.

Antibiotics including Cecilor should be administered with caution, and then only when absolutely necessary, to any patient who has demonstrated some form of allergy, particularly to drugs.

As is the case with all new drugs, patients should be followed carefully so that adverse reactions or unusual manifestations of drug idiosyncrasy may be detected. If an allergic reaction to Cecilor occurs, the drug should be discontinued and the patient treated with the usual agents (e.g., epinephrine, antihistamines, pressor amines or corticosteroids).

PRECAUTIONS: If an allergic reaction to Cecilor occurs, the drug should be discontinued and the patient treated appropriately.

The safety of cefaclor in the treatment of infections during pregnancy has not been established.

Prolonged use of cefaclor may result in the overgrowth of non-susceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, administration of Cecilor should cease and appropriate measures should be taken. Positive direct Coombs' tests have been reported during treatment with cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures, when antibody tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug. Cecilor should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage is likely to be lower than that usually recommended. In patients treated with Cecilor, a false-positive reaction for glucose in the urine may occur with Benedict's or Fehling's solution or with Clinitest tablets but not with Les-Lape (Glucose Enzymatic Test Strips, USP).

ADVERSE REACTIONS: Of 1493 patients treated with cefaclor, 87 (5.8%) had adverse reactions or abnormal laboratory values judged to be drug-related. The incidence of the reported side effects is shown in Table 1.

Table 1

	Related to Drug	Drug Discontinued
Nausea and Vomiting	0.5%	0.3%
Dyspepsia	0.3%	0.1%
Diarrhea	0.7%	0.5%
Rash (including urticaria and morbilliform eruptions)	0.6%	0.3%
Positive Coombs	0.3%	—
Eosinophilia	1.6%	—
Genital moniliasis	0.3%	—
Vaginitis	0.2%	0.1%
Elevated SGOT	0.3%	—
Elevated SGPT	0.2%	—

Other adverse reactions experienced less frequently include: pruritus, dizziness, headache, soreness, abdominal pain, leg cramps, abnormal taste, and fever. Leukopenia, decreased hemoglobin and hematocrit, neutrophilia, elevated alkaline phosphatase, lymphocytosis, lymphocytopenia, thrombocytosis, elevated BUN and creatinine, hematuria and pyuria have also been reported. Cases of serum sickness-like reactions, including skin manifestation, fever and arthralgia/arthritis, have been reported. Anaphylaxis has also been reported.

SYMPTOMS AND TREATMENT OF OVERDOSEAGE: There has been no experience of overdose with Cecilor. If a large overdose has been recently consumed, the patient should be kept under observation and appropriate treatment undertaken as considered necessary.

Disc Susceptibility Tests: For the determination of susceptibility to cefaclor, a standardized procedure using a 30 mcg cephalothin disc is considered appropriate. Beta-Lactamase Stability—Cecilor is active against many Beta-lactamase-producing organisms, particularly those gram-negative bacteria that produce the TEM (Richmond type IIIa) enzyme, such as ampicillin-resistant *E. coli* and *H. influenzae*.

DOSEAGE AND ADMINISTRATION: Cecilor is administered orally.

Adults:—The usual adult dosage is 250 mg every eight hours. For more severe infections or those caused by less susceptible organisms, larger doses may be needed. The maximum recommended dosage is 2 g per day, although doses of 4 g per day have been administered safely for 28 days.

For skin and soft-tissue infections, the dosage is 250 mg administered 2 or 3 times daily. Children—The usual recommended daily dosage for children is 20 mg/kg/day in divided doses every 8–12 hours. For streptococcal pharyngitis or tonsillitis and soft-tissue infections, the total daily dosage may be divided and administered every 12 hours.

In more serious infections, otitis media, and those infections caused by less susceptible organisms, 40 mg/kg/day is recommended, up to 1 g per day. In the treatment of Beta-hemolytic streptococcal infections, a therapeutic dosage of Cecilor should be administered for at least ten days.

Most clinical studies were performed with a duration of therapy between five and fourteen days.

DOSEAGE FORMS:

Cecilor 250 mg Pulvules 3061

Each opaque purple and white capsule contains 250 mg cefaclor; available in bottles of 100 capsules.

Cecilor 500 mg Pulvules 3062

Each opaque purple and grey capsule contains 500 mg cefaclor; available in bottles of 100 capsules.

Cecilor 125 mg for Oral Suspension (M-5057), 25 mg/ml

Reconstitute by adding 60 ml of water to each 100 ml bottle or 90 ml for each 150 ml bottle in two portions. Shake well after each addition.

Each 5 ml dose of strawberry-flavoured suspension contains 125 mg cefaclor.

Cecilor 250 mg for Oral Suspension (M-5058), 50 mg/ml

Reconstitute by adding 60 ml of water to each 100 ml bottle or 90 ml for each 150 ml bottle in two portions. Shake well after each addition.

Each 5 ml dose of grape-flavoured suspension contains 250 mg cefaclor.

After mixing, store in a refrigerator. The mixture may be kept for 14 days without significant loss of potency. Shake well before using. Keep tightly closed.



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Illness following MMR immunization

The categories of illnesses which presented during the three weeks following immunization are shown in Table 4. The overall illness ratio of Indian to non-Indian children is 1.8.

Discussion

Indian children had a higher rate of office-reported illness during the three weeks after MMR immunization compared to non-Indians (Table 4). The difference in illness rates is almost identical to the difference (or ratio) found in comparisons of annual rates reported previously. The risk of illness in Indian children relative to non-Indian children has been 1.8 in the first year³ and 1.5 in the second year.⁴ Thus, the overall rates of illness are as expected.

The incidence of otitis media and

lower respiratory disease among Indian children in previous reports is very high; our findings agree with these earlier reports.^{3, 4, 11, 12}

Once the health status post-MMR was examined in relation to health status pre-MMR, however, there was an indication that some children may be at greater risk of illness following immunization. We found that Indian children who visited with an illness before immunization were more likely to be seen with an illness in the post-MMR period.

The ethnic difference in age at immunization was statistically significant. This difference, however, is not clinically significant, because the mean ages were only one month apart and well within the guidelines suggested by present immunization policies.^{1, 2}

We included weight at age 12 months as a variable because we suspected that Indians in this study may be heavier, and we did not know if this would increase the risk of illness after immunization. The increased frequency of illness in Indian children post-MMR was not, in fact, associated with weight at age 12 months.

Indian children have been found to attend fewer well baby examinations during the first year than non-Indian children.³ Thus, the lack of a difference in the number of visits to the health centre suggests that while Indians are ill more often than non-Indians, the overall use of the medical facility is similar.

The National Advisory Committee on Immunization has stated that "minor infections, such as the common cold, are very common in pediatric age groups and are not contraindications to immunization".¹ Our study,

based on office-reported illness, seems to indicate that children with an established record of frequent illness, as is the case for many Canadian Indian children, are likely to experience an illness following MMR immunization. If this finding is confirmed by prospective studies assessing complete morbidity, rather than a chart review, it may be desirable to modify current recommendations. Immunization could be delayed, within reasonable time limits, until the high-risk child has experienced three illness-free weeks. ●

Acknowledgements

Dr. Evers is a Fellow of the Ontario Ministry of Health, Health Research Personnel Development Program. We would like to thank Dr. Tom Freeman for suggesting this research question and Dr. Martin Bass for his encouragement. We acknowledge the cooperation of the physicians and staff of the Southwest Middlesex Health Centre.

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TABLE 2
Illness Pre- and Post-MMR in Indian and non-Indian Children

Indian Pre-MMR		Not ill		Ill	
Post-MMR	No.	(%)	No.	(%)	
ill	14	(16.5)	10	(23.8)	
not ill	71	(83.5)	32	(76.2)	
	85	(100.0)	42	(100.0)	

McNemar $\chi^2 = 6.28$ (p=.012)

Non-Indian Pre-MMR

ill	9	(13.2)	2	(15.4)
not ill	59	(86.8)	11	(84.6)
	68	(100.0)	13	(100.0)

McNemar $\chi^2 = 0.05$ (p=.83)

TABLE 3
Weight at Age 12 Months and Illness Following MMR Immunization

Indian		Not ill		Ill	
Percentile weight	No.	(%)	No.	(%)	
<95th	75	(84.3)	15	(78.9)	
≥95th	14	(15.7)	4	(21.1)	
	89	(100.0)	19	(100.0)	

$\chi^2_1 = 0.05$ (p=.82)

Non-Indian		Not ill		Ill	
Percentile weight	No.	(%)	No.	(%)	
<95th	54	(93.1)	8	(88.9)	
≥95th	4	(6.9)	1	(11.1)	
	58	(100.0)	9	(100.0)	

$\chi^2_1 = 0.00$ (p=1.0)

TABLE 4
Rate* of Episodes of Illness During the 21 days Post-MMR

Diagnostic category	Indian (N=127)	Non-Indian (N=81)
Upper respiratory infection	5.5	3.7
Lower respiratory infection	5.5	0
Otitis media	7.9	2.5
Infective disease	0.8	4.9
Skin disease	4.7	2.5
Fever	1.6	1.2
Total	26.0	14.8

*No. of episodes
No. of children at risk $\times 100$